

# e-Government development: Benchmarking Ghana and Tanzania

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## Abstract

Using time-series data from the United Nations e-government Surveys, this paper presents the comparative assessment of e-government (e-gov) in Ghana and Tanzania over the last two decades. The findings confirm tremendous progress in e-government development in both nations. However, while Ghana has made significantly more progress, the indicators for both countries are below the world averages, suggesting the need for strategies to boost e-gov development. Furthermore, to accelerate e-gov implementation, both nations need to go beyond systematizing existing procedures by engineering new practices to transform the relationship between government and citizens.

## Keywords

E-government, benchmarking, Africa, Ghana, Tanzania, UN E-government survey

## 1. Introduction

Electronic government (e-gov), according to international organizations like the United Nations and the World Bank, is critical to good governance and development through fostering efficient, responsible, and inclusive institutions. E-gov implementation has many benefits: promoting socio-economic development by better access to public services, sharing information, and implementing online processing requests for diverse services. In addition, e-gov supports transparency, accountability, and corruption reduction by limiting bribery opportunities through ICT-led rearrangement of work practices [1]. Besides, e-gov simplifies public administration, improves the relationship between government and citizens, and strengthens the attainment of sustainable development goals (SDGs) (United Nations, 2020). Moreover, recent crises, like as the global Covid-19 outbreak, have spurred governments to use e-gov solutions to convey vital information via web portals, social media, and mobile apps, eliminating the need for face-to-face public service delivery [2, 3].

Osei-Kojo [4] encapsulates the role of e-gov into four dimensions – efficiency, customer satisfaction, economy, and service accessibility. Efficiency represents the delivery of e-gov in a timely and effective way via operations automation to save labor costs. Customer satisfaction evaluates the extent to which e-gov services meet the needs of stakeholders. At the same time, the economy involves the cost savings from e-gov by reducing paperwork, staffing, and office

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*EGOV-CeDEM-ePart 2022, September 06–08, 2022, Linköping University, Sweden (Hybrid)*

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visits, thus saving taxpayers' money [5]. Lastly, service accessibility denotes the availability and user-friendly e-gov services to all who need them.

While recent evidence demonstrates a considerable growth of e-gov globally, uptake is lowest in Africa because of weak infrastructure, low levels of literacy [6], and the difference between the design of e-gov and African realities, also known as the “design-reality gap” [7]. In addition, developing countries, particularly in Africa, face several hurdles regarding e-gov development. Gil-García and Pardo [8], in a review of the literature, recognized five principal types of difficulties with e-gov. The first concerns data quality issues such as inaccuracies, inconsistencies, and incompleteness of data. The second challenge relates to usability and ease of using ICTs for e-gov. Third, organizational factors, such as individual interests, might lead to resistance to change, conflicts, and turf issues. Fourth, the legal and regulatory environment can often be an obstacle to e-gov if complex and restrictive. Other barriers include a significant digital divide, insufficient e-infrastructure, and a lack of skills and competencies for designing, implementing, using, and managing e-gov systems [9]. Despite this, evidence suggests that most African governments have made remarkable progress in implementing e-government, with significant variations in performance [10].

In this paper, we study the e-gov progress of Ghana and Tanzania through benchmarking, an approach to making a comparative identification of the critical elements, particularities, and differences. Benchmarking is essential for informed and strategic decision-making to drive progress. Furthermore, international comparisons of e-gov can inform policy debates and be valuable to decision-makers, scholars, and practitioners [11, 12]. The Ghana and Tanzania e-gov comparison could help stakeholders understand the current state of e-gov and serve as a baseline for tracking future eGov progress. We chose Ghana and Tanzania as our benchmarks out of the 54 countries in Africa for two reasons: first, while both countries are in Sub-Saharan Africa, they are geographically distinct, with Ghana and Tanzania belonging to West Africa and East Africa, respectively. They are both latecomers to the Internet, so they have witnessed incredible progress and continue to do so.

Furthermore, Ghana and Tanzania are lower-middle-income countries with considerable economic growth hurdles, such as poor infrastructure development [2], but they have e-government initiatives. Based on the preceding, we address the following research question: how do Ghana and Tanzania compare in e-gov development? The paper contributes insights into progress by identifying gaps, challenges, and opportunities in both countries.

The rest of the paper proceeds as follows: The following section discusses the concept of e-gov, examines the contribution of e-gov to development, and gives an overview of the study countries of Ghana and Tanzania. After that, we discuss research methods and present the findings. Finally, after discussing the implications of the results, the paper concludes.

## **2. An overview of study countries**

Ghana was the first sub-Saharan African nation to gain political independence from Britain in 1957. Regarding administration, the country has 16 regions and has an estimated 30.83 million inhabitants. Ghana has implemented policies directed at e-gov. The purpose of the Information and Communication Technology for Accelerated Development (ICT4AD) policy of 2003 is to

promote ICT to transform Ghana into an information and knowledge society. In addition, the eGhana Project of 2006 was a collaboration between the Ministry of Communications and the World Bank to promote the development of e-gov applications and government communication. These policies notwithstanding, e-gov development is beset with infrastructural, economic, legal, and human resources challenges [13]. In addition, outdated laws and the culture of paper document flows were institutional barriers to budgeting digitalization [14].

On the other hand, the United Republic of Tanzania emerged as a union of Tanganyika and Zanzibar on 26 April 1964. Before gaining independence on 9 December 1961, Tanganyika was part of German East Africa and, later, a British colony from 1920 [15]. Tanzania's e-government plan, led by the e-Government Agency (eGA), establishes clear goals and targets for delivering better services to more individuals while assuring transparency and cost savings. The strategy involves four stages for the expected e-Gov evolution. These are Digital Presence: where government organizations provide one-way information and limited interaction with clients; Interaction: for citizens to use online facilities for requests, complaints, or job applications; Transaction: providing secure transactions where clients do not have to visit a government office to apply for services and make payments; and Transformation: allowing clients to interact with one government rather than individual government organizations [16].

Furthermore, while the country's e-Gov motto is "Responsive Government – Enabled by Technology," seven principles: service innovation, equal access, ease of use, benefits realization and involvement of all stakeholders, security and privacy, partnership and outsourcing, and interoperability, guide e-gov initiatives, and services. The strategy's six key performance indicators are: Having an institutional framework developed by 2018; Improving the human resources capacity by 2018; Developing government-wide electronic infrastructure by 2018; Implementing government-wide shared systems by 2018; Implementing e-Service flagship projects by 2017; and Increasing e-Government awareness by 2016 [16].

### **3. Data and methods**

To answer the research question, we examined time-series data from the United Nations E-government Survey (2003-2020), which quantifies the e-gov performance of countries and the basis for the E-government Development Index (EGDI), a weighted average of three standardized scores. The Online Service Index (OSI) calculates the breadth and quality of online services, while the Telecommunication Infrastructure Index (TII) measures the adequacy of telecommunications infrastructure. Lastly, the Human Capital Index (HCI) calculates the contribution of health and education to the productivity of the next generation of the workforce. The rankings derived from the survey are increasingly crucial for determining e-gov progress [17]. The standardized scores for each dimension are computed and combined, each making up a third of the EGDI [18]. In addition, the survey includes the e-Participation Index (EPI) on the use of online services to share information, consult and make decisions [10]. The survey data are credible and representative [19] and have provided valuable data for research and tracking e-gov development since 2001 [20, 21, 22, 23]. However, the primary drawback of Survey analysis is the lack of contextual information on the countries surveyed [23].

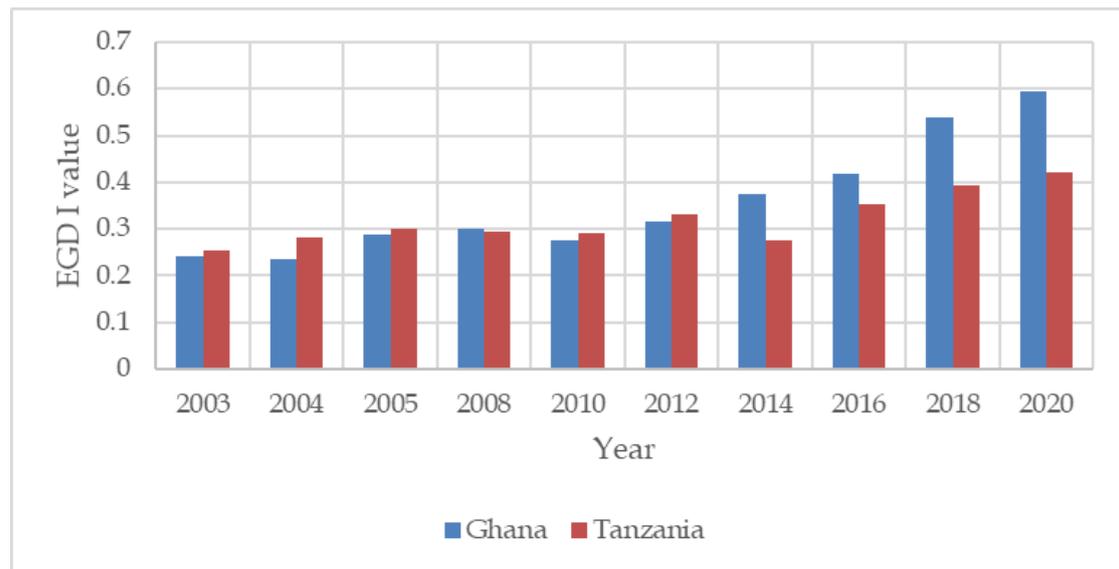
## 4. Findings

This section presents the findings in five parts: (1) trends in e-gov progress, (2) online services delivery, (3) telecommunications infrastructure, (4) human capital, and (4) e-participation.

### 4.1. Trends in e-government

To achieve the study purpose, we compared overall e-gov progress by analyzing both countries' EGDI scores and rank from 2003 to 2020. Figure 1 reveals that both countries have made considerable progress, particularly in the last five years. Ghana and Tanzania had similar EGDI scores between 2003 and 2013. Since 2015, however, Ghana has made significantly more progress. In the most recent survey in 2020, Ghana recorded almost 0.6, compared to 0.4 for Tanzania. The average EGDI score from 2003 to 2020 is 0.26 and 0.24 for Ghana and Tanzania, respectively, below the world average of 0.60.

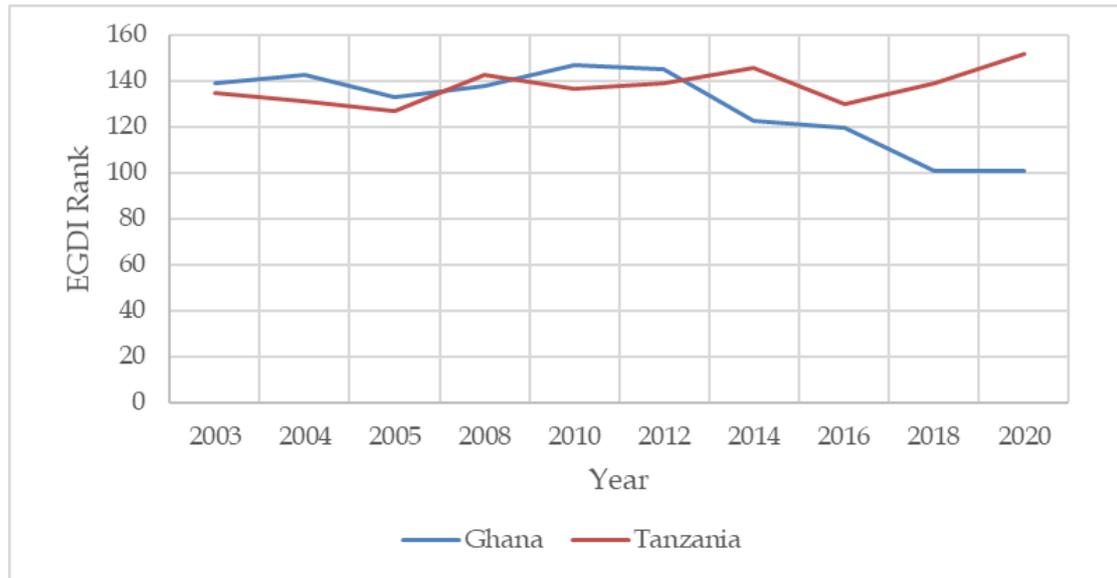
Similarly, Figure 2 summarizes the EGDI ranking of both countries, showing that Ghana's improved from 139 in 2003 to 101 by 2020, while Tanzania progressed from 152 to 135 in the same period. As a result, Ghana and Tanzania have an average rank of 129 and 138 out of 191 countries. In terms of overall EGDI performance, Ghana is the West African sub-regional leader in e-gov development, ahead of Nigeria. At the same time, Tanzania is third in the East African area, behind Mauritius and Kenya.



**Figure 1:** Trends in EGDI scores

### 4.2. Online services delivery

OSI assesses governments' online presence, websites' technical features, and e-gov policies and strategies on a scale of 0 to 1. It examines the technical aspects of government web pages.



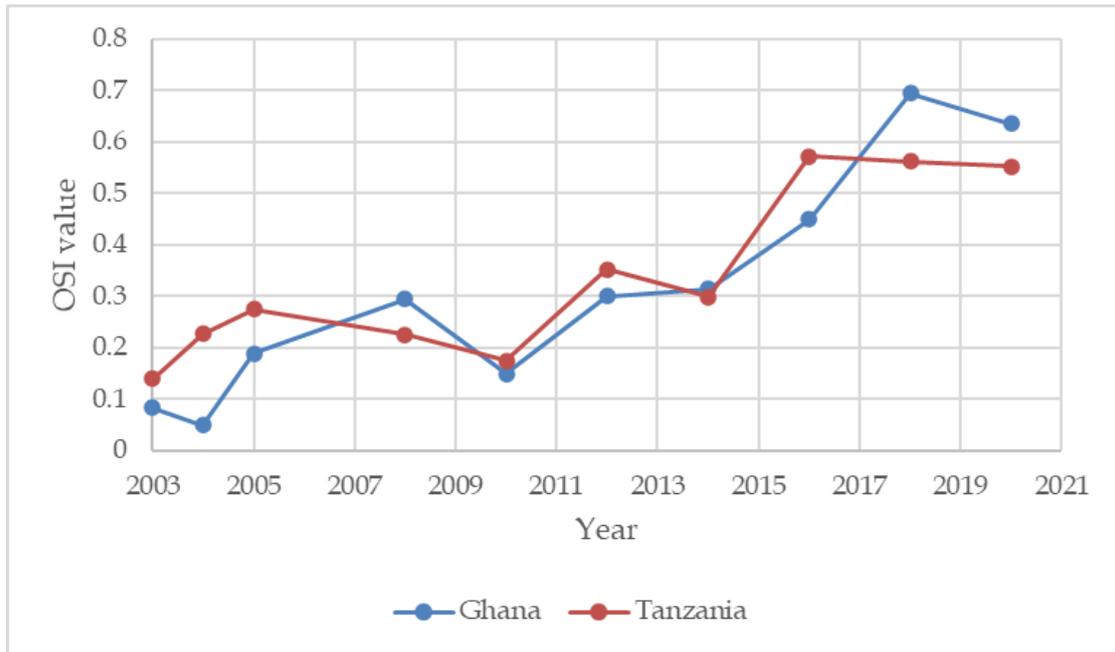
**Figure 2:** Trends in Ranking scores for Ghana and Tanzania

Instead of perfection, a high OSI value shows best practice. On the other hand, a lower score does not imply a lack of development in the delivery of online e-government services. Instead, it examines the technical aspects of government web pages. Instead of perfection, a high OSI value shows best practice.

On the other hand, a lower score does not imply a lack of development in the delivery of online e-government services. To capture the effect of the availability of online services, we compared the scope of online services in the two countries using the OSI values from 2003 to 2020. The evidence shows that both countries have made decent progress since 2003 – for example, Ghana from 0.083 in 2003 to 0.64, a growth of 0.55. In the same period, Tanzania’s OSI score has risen from 0.14 to 0.55, an increase of 0.41. The most recent OSI scores, recorded in 2020, show that Ghana (0.64) is doing better than Tanzania (0.55) in delivering government services online. Interestingly, Tanzania outperformed Ghana in 2003, 2004, and 2005, indicating e-gov progress fluctuations. The average OSI scores from 2003 to 2020 for Ghana and Tanzania are 0.260455 and 0.237267, respectively.

### 4.3. Telecommunications infrastructure development

The TII computes telecommunication infrastructure availability and readiness to embrace digital solutions to improve e-gov. The TII considers estimated Internet users, the number of fixed telephone lines and mobile subscribers, wireless broadband subscriptions, and fixed broadband subscriptions per 100 inhabitants. Both countries have seen improvements in telecommunications infrastructure and e-gov readiness (see Figure 3). Tanzania improved its TII score from 0.00873 in 2003 to 0.243 and Ghana from 0.019 to 0.5598. The most striking result to emerge on TII is that Ghana recorded over twice the TII scores of Tanzania in 2014, 2016, 2018,



**Figure 3:** Trends in OSI values for Ghana and Tanzania

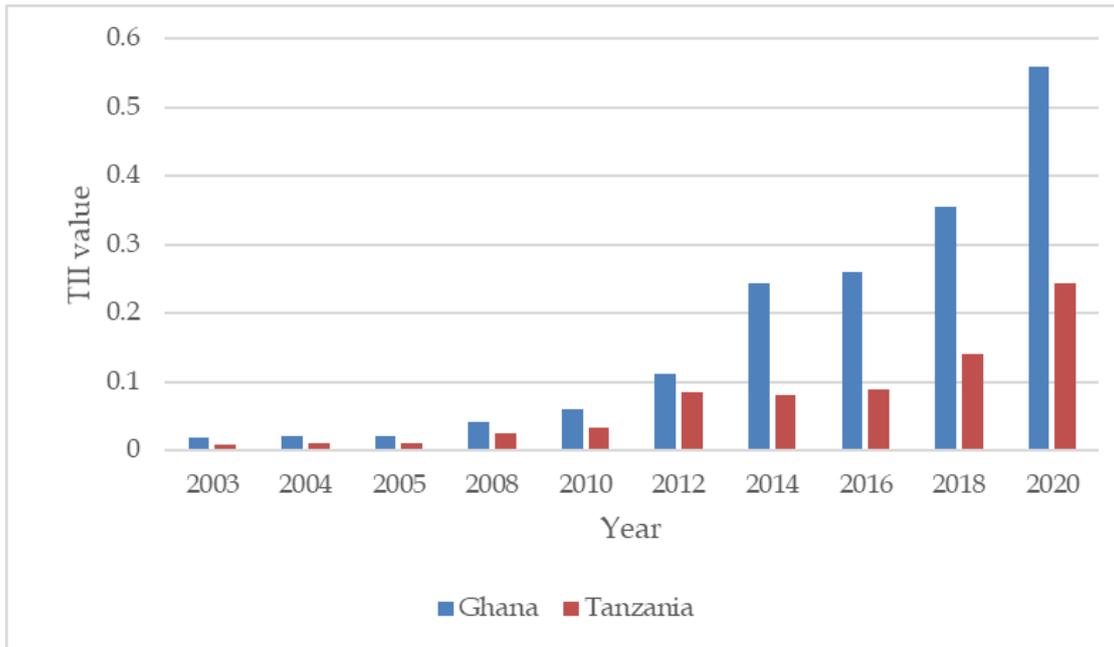
and 2020. Ghana and Tanzania have average TII scores of 0.169137 and 0.072666, respectively. Thus, in terms of TII, Tanzania made far less progress than Ghana.

#### 4.4. Human capital

The HCI estimates children's productivity and human capital potential based on optimal health and education conditions. In addition, the HCI quantifies economic losses from sub-optimal investments and their returns on human capital. An e-gov success critical factor is the presence of educated with the right skills, knowledge, aptitudes, and motivation. We found similar HCI scores for both countries from 2003 to 2012, with only moderate differences. Between 2014 and 2020, however, Ghana made better progress than Tanzania. Our analysis shows that Ghana had an average HCI score of 0.59. At the same time, Tanzania recorded 0.55, which suggests that if present trends persist, children born would only realize 59 percent and 55 percent of their highest potential in Ghana and Tanzania, respectively. Thus, the general health and education standards would cost Ghana 41% of its national income. The equivalent number for Tanzania is 45%.

#### 4.5. e-Participation

We analyzed e-participation for both countries from 2003 to 2020. The OSI value ranges from 0 (worst) to 1 (best). Ghana improved from 0.0345 in 2003 to 0.631, an increase of 0.5965, while Tanzania advanced from 0.0172 to 0.5595, an improvement of 0.5423. As a result, the average e-participation rank for Ghana is 92 and Tanzania 108. As the Figure shows, Ghana has



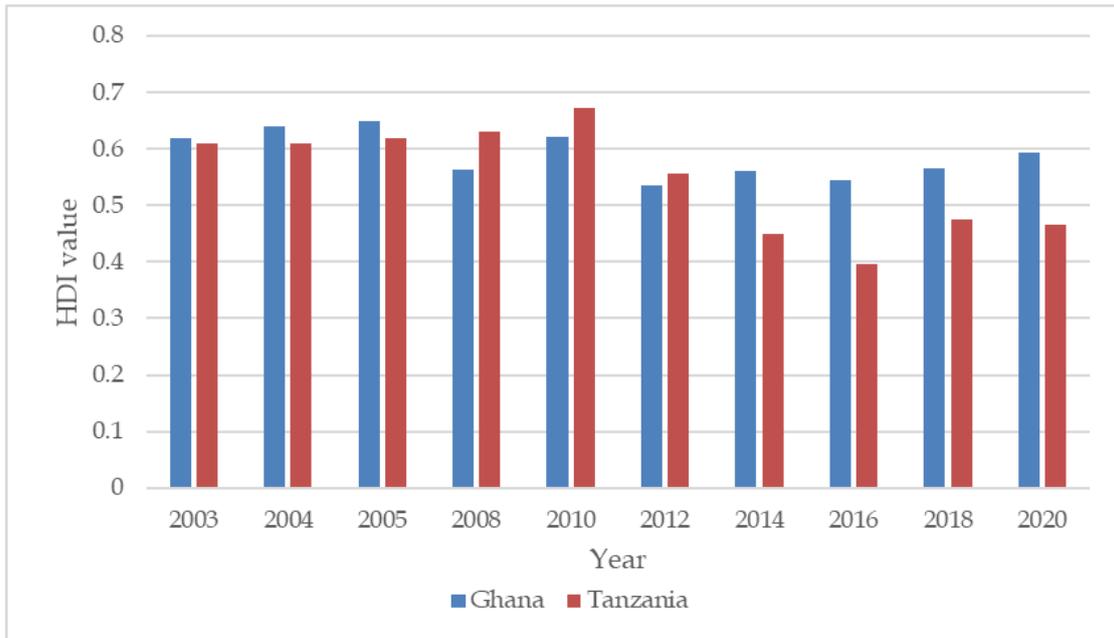
**Figure 4:** TII values for Ghana and Tanzania compared

outperformed Tanzania in the EPI scores for all the years except 2016. However, the difference in e-participation performance has been insignificant for most years. In terms of e-participation rank (see Figure 5), Ghana has moved from 102 in 2003 to 82 in 2020. In contrast, Tanzania moved from 123 to 98 in the same period. The most recent data in 2020 reveals that Ghana is 16 points above Tanzania in the rankings. However, the average e-participation scores of 0.26 (Ghana) and 0.24 (Tanzania) are below the global average of 0.57, implying that 26 and 24 percent of Ghana and Tanzania's population are involved with e-participation, compared to the world average of 57%.

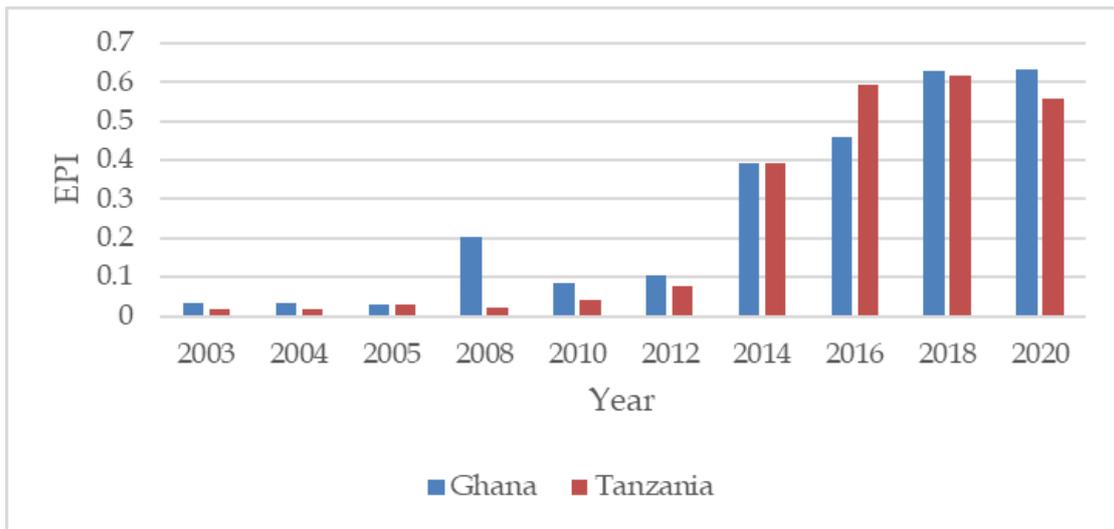
## 5. Discussion

We compared the e-gov development of Ghana and Tanzania using time series data from the United Nations E-government Surveys for 2003 to 2020. To gain a better insight, we examined the trend in online services delivery, the status of telecommunications infrastructure, and human capital. We also examined levels of e-participation. Our analysis found that both countries have made significant development in e-gov, even though Ghana has made significantly higher progress than Tanzania. Despite this, considerable challenges remain. This critical question emerges from this work: What are the implications of the findings for e-gov improvement in Ghana and Tanzania?

The low TII score suggests that telecommunications and ICT infrastructures are a relative weakness and a significant challenge to e-gov progress for both countries. Yet prior research has highlighted the importance of well-developed ICT and telecommunications for e-gov progress

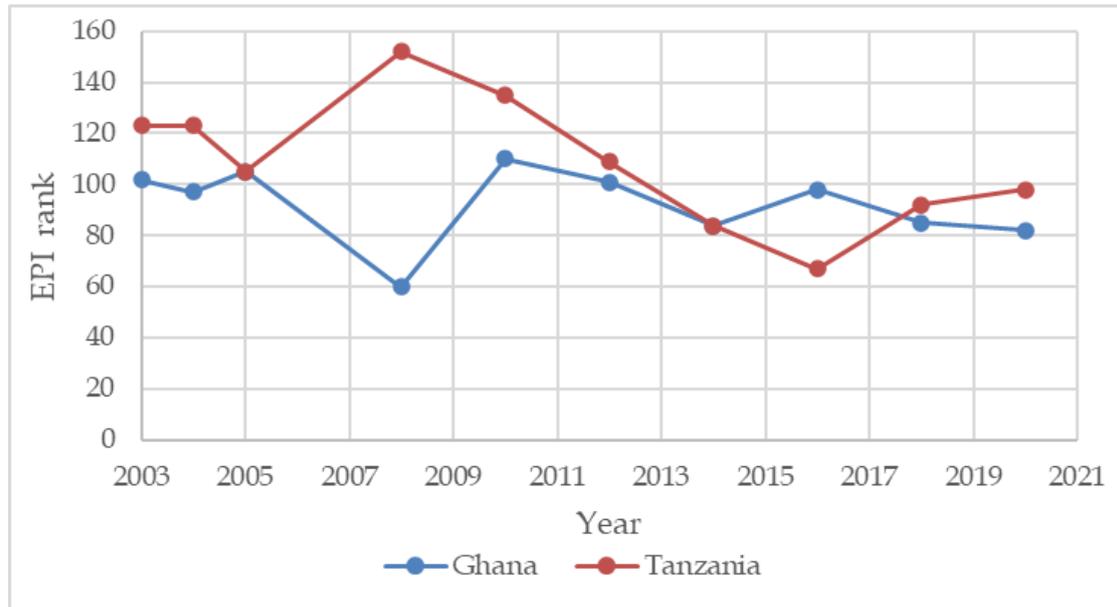


**Figure 5:** HCI scores of Ghana and Tanzania compared



**Figure 6:** EPI scores of Ghana and Tanzania compared

[24, 1]. The digital divide persists in developing countries, causing poor access and use of ICTs by large segments of the population [25]. This finding implies that both countries should address the digital divide by prioritizing investment in the growth and development of technical, legal, and regulatory aspects of telecommunications/ICTs to provide a firm foundation for e-gov progress. Such assets will enhance the e-readiness of the countries to harness the potential of



**Figure 7:** EPI Rank for Ghana and Tanzania

ICTs and allow citizens to benefit from e-gov applications. In addition, however, governments could improve institutional capacity through partnerships with the private sector and non-governmental organizations.

It is well established by various studies that e-participation, the use of digital tools for political participation, can encourage democratic values such as openness and accountability [26]. However, we found low e-participation rates of 26 and 24 percent for Ghana and Tanzania, respectively, below the regional average of almost 40 percent and the world average of 57 percent. E-gov interventions are necessary to foster e-government development by supplying a wide range of high-quality government services through online portals. However, Verkijika and De Wet [18] found the need for online services, which found that e-gov websites in sub-Saharan Africa have poor usability, negatively affecting e-gov. To improve e-gov is essential to go beyond systematizing current processes and inefficiencies by engineering new strategies to transform the relationship between government and citizens.

## 6. Conclusion, limitations, and further research

This article set out to provide a basic understanding of the e-gov progress of Ghana and Tanzania. In our view, the benchmarking of e-gov progress in individual African countries is minimal. Therefore, drawing on data from United Nations E-gov Surveys from 2003 to 2020, we benchmarked e-gov development in Ghana and Tanzania to uncover similarities and differences and draw implications. Overall, we found similarities and moderate differences in e-gov development between Ghana and Tanzania. However, although both countries have made considerable progress, all key e-gov indicators are below the world averages. In addition,

both countries are resource-poor in terms of ICTs and the human resources that underpin e-gov. Therefore, investments are necessary to improve e-gov.

The study's limitations open a variety of new research possibilities. First, a limitation of this study is that the data is quantitative and computes e-gov averages but not the factors behind the scores. We hope this preliminary study will pave the way for a more comprehensive future investigation of e-gov using primary qualitative data. Primary research may help determine the factors behind the e-gov scores, paving the way for more targeting suggestions for improving e-gov. Second, the UN e-gov survey may be a limitation because it cannot examine the factors that influence e-gov success. As a result, an in-depth comparative study of e-gov in Ghana and Tanzania could be a potentially worthwhile direction for further research. Third, to better understand e-government in Africa, further research is necessary to compare e-gov in other African countries using primary qualitative data. Finally, research on the barriers to e-government in Africa could be beneficial.

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